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Indian Standard

METHOD FOR DETERMINATION OF DIMENSIONAL STABILITY OF TEXTILE FABRICS TO DRY HEAT

UDC 677·074 : 677·017·635

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
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METHOD FOR DETERMINATION OF DIMENSIONAL STABILITY OF TEXTILE FABRICS TO DRY HEAT

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Indian Standard
METHOD FOR DETERMINATION OF DIMENSIONAL STABILITY OF TEXTILE FABRICS TO DRY HEAT

0. FOREWORD

0.1 This Indian Standard was adopted by the Bureau of Indian Standards on 31 August 1987, after the draft finalized by the Chemical Methods of Test Sectional Committee had been approved by the Textile Division Council.

0.2 Textile fabrics usually change in dimensions when exposed to dry heat due to various processes which they may undergo during contact with hot metal surfaces under pressure. Preparation of standard method to determine their dimensional stability to dry heat, therefore, needs no emphasis.

0.3 In reporting the result of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS : 2 - 1960*.

1. SCOPE

1.1 This standard prescribes a method for determination of dimensional change of all kinds of textile fabrics, when exposed to dry heat. It is intended to predict the behaviour of fabrics in garment-making processes such as fusing and transfer printing or during their contact with hot metal surfaces under pressure.

2. DEFINITIONS

2.0 For the purpose of this standard, the following definitions shall apply.

2.1 Narrow Fabric — A fabric constructed at 450 mm width or less.

2.2 Wide Fabric — A fabric constructed at more than 450 mm width.

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*Rules for rounding off numerical values (*revised*).

2.3 Dimensional Change, Percent — The increase or decrease in dimensions (that is, in length or width) after subjecting the fabric to the prescribed test, expressed as a percentage of the corresponding dimensions before such test.

3. PRINCIPLE

3.1 A specimen of fabric is heated by contact with a plane, hot surface under accurately known conditions and changes in specimen dimensions are measured.

4. SAMPLING

4.1 Lot — The quantity of same kind and quality of fabric delivered to a buyer against one despatch note shall constitute a lot.

4.2 Sample to determine conformity of a lot to a specification shall be selected so as to be representative of the lot.

4.3 Unless otherwise stated in the contract or order or in the appropriate textile specification, the sample drawn according to **4.4** and Table 1 shall be held to be representative of the lot.

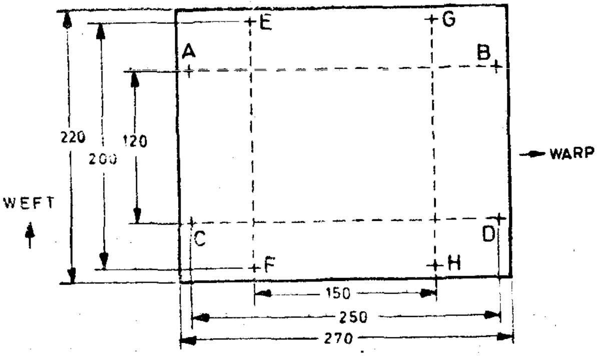
TABLE 1 SAMPLING FREQUENCY

LOT SIZE (NO. OF PIECES)	SAMPLE SIZE (NO. OF PIECES)
Up to 10	3
11 to 50	4
51 to 100	5
101 to 200	6
201 and above	7+1 for each additional 100

4.4 Samples shall not be taken from first few metres of the fabric. For coated fabrics, the samples shall be taken from areas of the fabric well away from the ends. All fabric samples shall be of full width.

5. PREPARATION OF TEST SPECIMENS

5.1 Cut two uncreased fabric specimens 270 × 220 mm. After conditioning from the dry side, mark two pairs of reference points in each direction as shown in Fig. 1 so that the distances between corresponding reference points are 250 mm in the warp or wale direction, and 200 mm in the weft or course direction.



All dimensions in millimetres.

FIG. 1 MARKING OF TEST SPECIMENS

6. CONDITIONING OF TEST SPECIMENS

6.1 Prior to test, the test specimens shall be conditioned to moisture equilibrium from dry side in a standard atmosphere of 65 ± 2 percent relative humidity and 27 ± 2°C temperature (*see* IS : 6359-1979*).

6.2 When the test specimens have been left in such an atmosphere for 6 hours in such a way as to expose, as far as possible, all portions of the specimens to the atmosphere, they shall be deemed to have reached moisture equilibrium. However, in the case of fabrics weighing more than 240 g/m², this period shall be not less than 16 hours.

7. APPARATUS

7.1 A Press — consisting of a plane heated metal plate whose temperature can be adjusted within the range 100 to 210°C with an accuracy of ± 2°C, and a horizontal bed. When closed, the press exerts a uniform pressure of 4 ± 1 kPa between the plate and bed. The bed is covered by flexible and compressible cladding of low thermal conductivity and heat capacity, which is capable of conforming to slight variations in the thickness of specimens or of the gap between plate and bed. The cladding shall be unaffected by the highest temperature used and shall not absorb moisture.

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*Method for conditioning of textiles.

NOTE — A silicone foam rubber layer, supported on a low density textile wadding has proved suitable for the cladding specified in 7.1.

7.2 Specimen Holder — consisting of a thin flexible sheet of material with low friction and low heat capacity, larger than the heated plate, and supported at its edges by a light frame which does not impede contact between the plate and bed.

NOTE — A sheet of 0·15 mm thickness, polytetra fluoroethylene with glass fibre reinforcement and a total mass per unit area of 250 g/m², has been found suitable.

7.3 Steel Measuring Scale or Other Means of Measuring Length — accurate to 0·5 mm.

7.4 Means of Cutting Out and Marking Fabric Specimens — Marking may be by notches, sewing thread, or other means of equal precision that do not significantly increase the thickness of the specimens.

8. PROCEDURE

8.1 Determine the dimensions *AB*, *CD*, *EF* and *GH* of the conditioned specimen to the nearest 0·5 mm.

8.2 Set the press at one or more of the following temperatures, unless otherwise specified in the appropriate textile specification, and leave the press closed until it reaches a steady state of temperature:

Test	*Temperature*
Mild	150 ± 2°C
Intermediate	180 ± 2°C
Severe	210 ± 2°C

8.3 Place the conditioned fabric specimen on the specimen holder. Open the press, place the holder and specimen in position on the bed and close the press so that a pressure of 4 ±1 kPa is applied on the specimen. Leave the specimen in this condition for 30 seconds. Then immediately open the press and remove the specimen and holder.

NOTE — It is essential that the working area of the test press shall be larger than the specimen size.

8.4 Condition the specimen in its flat state in the standard atmosphere, until the equilibrium is reached.

8.5 Measure the dimensions *AB*, *CD*, *EF*, *GH* of the specimen to the nearest 0·5 mm.

8.6 Repeat the procedure with the second specimen.

9. CALCULATION AND EXPRESSION OF RESULTS

9.1 Calculate, for each specimen, the changes in dimensions for each test length as follows:

Change in dimension (percent)=

$$\frac{\text{new dimension} - \text{original dimension}}{\text{original dimension}} \times 100$$

9.2 For each specimen, calculate the mean dimensional change in each direction.

10. REPORT

10.1 The report shall include the following:

a) Details of the samples tested,

b) The mean dimensional change in both directions for each specimen expressed as in **9**,

c) The temperature used for testing, and

d) Any deviation from the test conditions described in **8.2** and **8.3**.

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